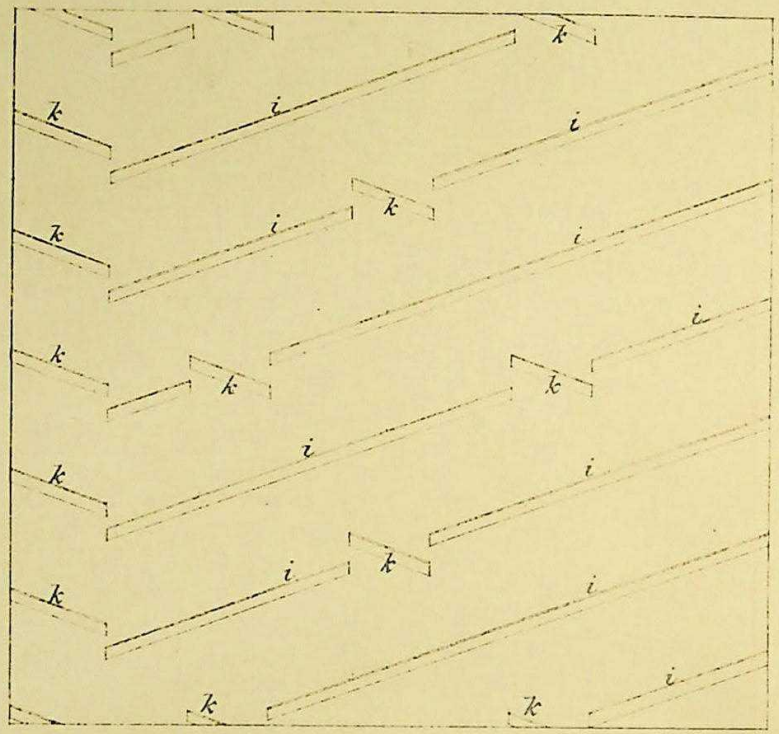



Fig. 3.

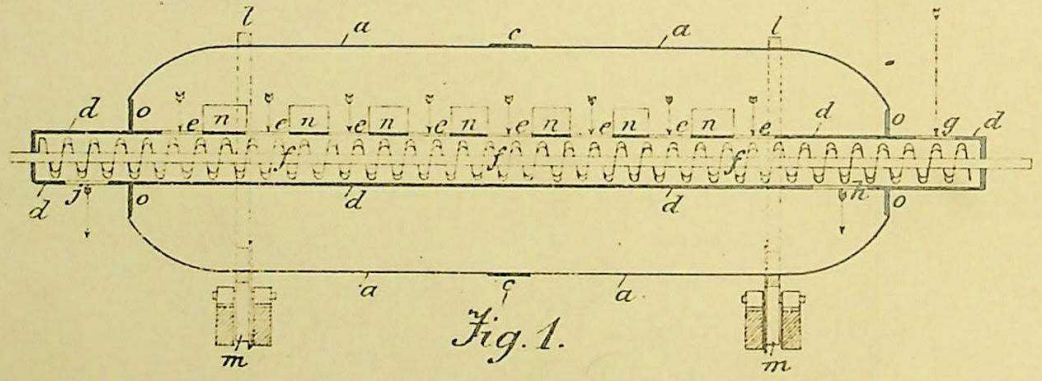
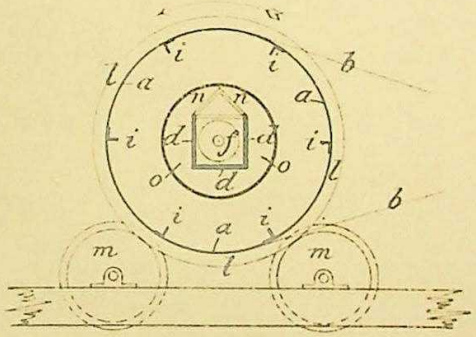



Fig. 1.

Fig. 2.

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N° 18,216 A.D. 1893

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*Complete Specification Left, 28th June, 1894—Accepted, 28th July, 1894*

PROVISIONAL SPECIFICATION.

## Improvements in Machinery or Apparatus for Mixing Manures, Seeds, and other Substances.

I, RICHARD SILCOCK, of Thornton Hall, Poulton-le-Fylde, in the County of Lancaster, Seed Crusher and Manure Manufacturer, do hereby declare the nature of this invention to be as follows :—

This invention relates to that class of mixing machinery or apparatus in which the substances or materials to be mixed are placed within a revolving barrel or drum (hereinafter referred to as the "drum") rotating in a vertical plane. My improvements have for their object to facilitate the introduction or feeding of the materials into the interior of the drum and also the withdrawal or pushing out of the said materials when mixed. Heretofore it has usually been the practice to provide the said revolving drum with a door or lid through which—when opened—the materials to be mixed were introduced into and subsequently withdrawn from the drum after undergoing the agitating or mixing process the apparatus having thus to be brought to a standstill during the operations of charging and emptying—time being thus lost. Now according to my invention the materials are fed into the drum and also withdrawn or expressed therefrom whilst the said drum is revolving. To this end I arrange centrally or axially of the drum—which may be rotated by any of the usual well-known methods—a fixed trough open at its upper side along the interior of which is arranged a rotating screw or "travelling worm." The said trough and worm extend somewhat through the two ends of the drum the materials to be mixed being supplied or fed from a suitable hopper or hoppers into one end of the trough and finding their way by means of the rotating worm through an opening in the bottom of the trough into the interior of the drum. The said drum may be provided with diagonally arranged wings or it may be inclined so as to give the materials being operated upon the required tendency to move or travel towards the outlet end of the drum. The interior of the drum is provided with projecting wings or "lifters" which as the drum revolves raise or lift portions of the material and throw or pitch them into the open trough along which they are carried by the rotating worm to the outside of the outlet end of the drum where the mixed material is discharged.

Dated this 28th day of September 1893.

W. LLOYD WISE,
Per F. J. Brougham,
46, Lincoln's Inn Fields, London, W.C., Agent for the Applicant.

COMPLETE SPECIFICATION.

## Improvements in Machinery or Apparatus for Mixing Manures, Seeds, and other Substances.

I, RICHARD SILCOCK, of Thornton Hall, Poulton-le-Fylde, in the County of Lancaster, Seed Crusher and Manure Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement :—

This invention relates to that class of mixing machinery or apparatus in which the substances or materials to be mixed are placed within a revolving barrel or

drum (hereinafter referred to as the "drum") rotating in a vertical plane. My improvements have for their object to facilitate the introduction or feeding of the materials into the interior of the drum and also the withdrawal or pushing out of the said materials when mixed. Heretofore it has usually been the practice to provide the said revolving drum with a door or lid through which—when opened—the materials to be mixed were introduced into and subsequently withdrawn from the drum after undergoing the agitating or mixing process the apparatus having thus to be brought to a standstill during the operations of charging and emptying—time being thus lost. Now according to my invention the materials are fed into the drum and also withdrawn or expressed therefrom whilst the said drum is revolving. To this end I arrange centrally or axially of the drum—which may be rotated by any of the usual well-known methods—a fixed trough open at its upper side along the interior of which is arranged a rotating screw or "travelling worm." The said trough and worm extend somewhat through the two ends of the drum the materials to be mixed being supplied or fed from a suitable hopper or hoppers into one end of the trough and finding their way by means of the rotating worm through an opening in the bottom of the trough into the interior of the drum. The said drum may be provided with diagonally arranged wings or it may be inclined so as to give the materials being operated upon the required tendency to move or travel towards the outlet end of the drum. The interior of the drum is provided with projecting wings or "lifters" which as the drum revolves raise or lift portions of the material and throw or pitch them into the open trough along which they are carried by the rotating worm to the outside of the outlet end of the drum where the mixed material is discharged.

In the accompanying drawings,

Fig. 1 is a sectional side view and

Fig. 2 a sectional end view illustrating the general arrangement of mixing machinery or apparatus constructed according to my said invention.

In the said figures *a* represents the revolving drum which may conveniently be rotated by means of a driving belt *b* preferably running on a slightly enlarged part *c* on the periphery of the drum. *d* is the fixed trough—which I find in practice to answer better if made with a number of openings *e e* instead of being open the entire length of the drum—and *f* is the screw or travelling worm which may be carried in ordinary end bearings and rotated by a belt pulley or in any other convenient manner. I prefer to employ conical or sloping pieces *n n* between the openings *e e* to prevent the material under treatment lodging on the (otherwise flat) closed parts or top of the trough *d*. The substances to be mixed are supplied or fed from any suitable form of hopper or hoppers into the inlet end of the trough *d* through an opening *g* and find their way through an opening *h* in the bottom of the trough into the interior of the revolving drum. *i i* are wings or lifters arranged in the interior of the drum *a* which as the drum revolves raise or lift portions of the material and throw or pitch them on to the trough and—some of them—through the openings *e e* to be carried along the interior of the trough by the rotating worm *f* to the outside of the outlet end of the drum where the mixed material is discharged through an opening *j* in the bottom of the trough *d*.

Fig. 3 is a diagrammatic view of the interior of the drum flattened out for the purpose of illustrating—more clearly than could practicably be done at Fig. 1—an arrangement of the wings or lifters which I have found to answer in practice. The longer wings or lifters *i i* are inclined or set at an angle so as to cause the material to be moved or "wormed" forward along the interior of the revolving drum from the inlet end towards the outlet end but I find it facilitates the mixing operation to employ in addition a number of shorter wings or lifters *k k* arranged at intervals as shewn and inclined in the reverse direction to that of the principal lifters *i i* the action of the shorter wings *k k* being to retard somewhat the progress of the material through the drum and by acting upon it in the reverse way to effect the mixing process more thoroughly. *l l* are rings affixed to the periphery of the drum *a* which rest upon anti-friction pulleys or wheels *m m*. *o o* are fixed

stationary end pieces which fill up or close the circular holes in the two ends of the revolving drum *a* these end pieces being of course an easy fit within the said circular holes.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed I declare that what I claim is :—

In machinery or apparatus for mixing manures seeds and other substances the combination with a revolving drum having internal wings or lifters of a centrally arranged trough having an opening or openings at its upper side and enclosing or containing a rotating screw or worm with an inlet to and an outlet from the interior of said trough externally of the revolving drum substantially as described and shewn in the drawings.

Dated this 28th day of June 1894.

For the Applicant,

W. LLOYD WISE,

46, Lincoln's Inn Fields, London, W.C., Chartered Patent Agent.

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